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| 09/811,898 | 03/19/2001 | Takanobu Yoshino | 09792909-4811 | 7628 |

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EXAMINER

YUAN, DAH WEI D

| ART UNIT | PAPER NUMBER |
|----------|--------------|
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1745

DATE MAILED: 05/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/811,898

Applicant(s)

YOSHINO ET AL.

Examiner

Dah-Wei D. Yuan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 April 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 3-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 3,4 and 12-18 is/are rejected.
- 7) ☒ Claim(s) 5-11 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☒ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

**METHOD OF MANUFACTURING A BATTERY INCLUDING A POSITIVE
ELECTRODE, A NEGATIVE ELECTRODE AND AN ELECTROLYTE LAYER**

Examiner: Yuan S.N. 09/811,898 Art Unit: 1745 May 16, 2003

Detailed Action

1. The Applicant's amendment filed on April 8, 2003 was received. The title of the invention was changed. Claims 1,2 were canceled. Claims 3,4,12,17 were amended. Claim 18 was added.
2. The text of those sections of Title 35, U.S.C. code not included in this action can be found in the prior Office Action (Paper No. 5).

Claim Rejections - 35 USC § 102

3. The claim rejections under 35 U.S.C. 102(b) as anticipated by Miyazaki et al. on claims 1,2 are withdrawn, because these claims have been canceled.
4. Claim 18 is rejected under 35 U.S.C. 102(b) as being anticipated by Miyazaki et al. (US 6,162,264).

Miyazaki et al. teach a method of manufacturing a battery comprising a positive electrode (37, LiCoO₂), a negative electrode (38, a carbonaceous material) and a separator (39, electrolyte layer) arranged between the positive electrode and the negative electrode. Miyazaki et al. disclose steps of (1) applying an electrode forming composition comprising active material and a binder on a collector, (b) impregnating the active material layer with liquid material, (c)

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solidifying the liquid material to form a solidified material, and (d) peeling a portion of the active material so the electrode active material is formed intermittently on the collector (see Figures 19 and 23). Furthermore, Figure 8 shows an electrode plate in which terminals (7) are attached to the non-coated portions in the current collector (1). The contact region between the terminal and the electrode plate is excluded of any electrolyte layer (see Figure 22). Miyazaki et al. further disclose the steps of filling the separator (39) with non-aqueous electrolyte on regions where the electrode active material is formed. The existence of the electrode active material and a coating layer is unfavorable for a certain portion of the electrode plate, for example, for a portion to which a terminal is connected for introducing an electric current, and for a portion along which the electrode plate is subjected to a cutting work, i.e., electrode plate is cut between the intermittently formed electrode active material. See Column 1, Lines 35-54; Column 2, Lines 35-50; Column 4, Lines 4-19.

Claim Rejections - 35 USC § 103

5. The claim rejections under 35 U.S.C. 103(a) as unpatentable over Miyazaki et al. and Akahira on claims 3,12-17 are withdrawn because independent claim 1 has been canceled.
6. The claim rejections under 35 U.S.C. 103(a) as unpatentable over Miyazaki et al. and Kaido et al. on claim 4 are withdrawn because independent claim 1 has been canceled.

7. Claims 3,12-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyazaki et al. (US 6,162,264) as applied to claim 18 above in view of Akahira (US 6,387,562).

Miyazaki et al. teach a method of manufacturing a battery as described in Paragraph 4 above. However, Miyazaki et al. teach neither a step of disposing a protection tape on the terminal after the terminal is attached to the current collector nor the use of gel-type electrolyte. Akahira teaches a method to manufacture a non-aqueous electrolyte cell. The method includes a step to cover a portion of the terminal with a laminated film (2) and, subsequently, the rim portion of the resulting assembly is heat-fused for hermetic sealing. Thus, the reliability and operating life of the battery can be improved. See Figure 2; Column 4, Lines 24-33. Therefore, it would have been obvious to one of ordinary skill in the art to cover a portion of the terminal after the terminal is attached to the exposed current collector in battery of Miyazaki et al., because Akahira et al. teach the use of a laminated film on the bare current collect to achieve hermetic sealing and improve performance of the battery assembly.

With respect to claims 12-17, Miyazaki et al. do not teach the use of an electrolyte comprising electrolyte salts and macromolecular compounds. Akahira teaches the active electrode layer is partially removed to expose the current collect and the terminal lead can be mounted on the exposed portion. A gel-like electrolyte is used on the entire surface, which is found to be beneficial in preventing shorting otherwise caused by the current collector being exposed to outside. The gel-like electrolyte can be a wide variety of high molecular material including polyvinylidene fluoride. The lithium salts used in the gel-like electrolyte include LiAsF_6 and LiCF_3SO_3 . Solvents used include ethylene carbonate and propylene carbonate.

Carbon materials, including pyrocarbon, cokes and graphite, can be used as the negative electrode material while LiCoO_2 and LiNiO_2 can be used as the positive electrode material. See Column 4, Lines 24-33, 64 to Column 5, Line 15; Column 6, Lines 31-58; Column 7, Lines 1-36; Column 8, Lines 8-20. Therefore, it would have been obvious to one of ordinary skill in the art to use the gel-like electrolyte in the battery of Miyazaki et al., because Akahira et al. teach that the use of such electrolyte can prevent shorting in the resulting battery.

8. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miyazaki et al. (US 6,162,264) as applied to claim 18 above in view of Kaido et al. (US 6,314,638).

Miyazaki et al. teach a method of manufacturing a battery as described in Paragraph 4 above. However, Miyazaki et al. do not teach the active electrode materials are formed on both sides of the current collector in the battery assembly. Kaido et al. teach a method to form active electrode material intermittently over the surface of the current collector as shown in Figure 8. Moreover, the electrode material is coated sequentially or simultaneously to front and back surfaces of the current collector so that uncoated areas at predetermined intervals in the longitudinal direction are obtained. See Column 34, Line 66 to Column 35, Line 5. Therefore, it would have been obvious to one of ordinary skill in the art to coat both surfaces of the electrode collector with active electrode material on the battery of Miyazaki et al., because Kaido et al. teach the active electrode material can be coated on both faces of the current collector sequentially in order to improve the efficiency and performance of the resulting electrochemical cell.

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Allowable Subject Matter

9. Claims 5-11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claims 5-11 would be allowable because the prior art does not disclose or suggest the formation of the electrolyte layer by using an electrolyte delivering machine having a pressurization means.

Response to Arguments

10. Applicant's arguments filed on April 18, 2003 have been fully considered but they are not persuasive.

Applicant's principle arguments are

The instant disclosure does not require a peeling-off process as disclosed in the Miyazaki reference.

In response to Applicant's arguments, please consider the following comments.

The term "comprising" in the claim 18 is an open language, which could encompass additional process steps. More importantly, the Miyazaki reference also teaches a process that intermittently forms an electrode active material on the collector as shown in Figure 19.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dah-Wei D. Yuan whose telephone number is (703) 308-0766. The examiner can normally be reached on Monday-Friday (8:00-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan, can be reached on (703) 308-2383. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.


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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Dah-Wei D. Yuan
May 19, 2003


CAROL CHANEY
PRIMARY EXAMINER